

AMENDMENTS TO THE DRAWINGS

A replacement sheet is provided to more clearly show the subject matter of Fig. 3.

Attachment: Replacement Sheet(s): One (1) replacement sheet (Fig. 3)

REMARKS

Claims 1 to 27 are all the claims pending in the application, prior to the present Amendment.

The Examiner has attached to the Office Action copies of the PTO/SB/08 Forms filed with the Information Disclosure Statements of March 1, 2006 and May 12, 2006. The Examiner has initialed and dated these Forms to indicate that she has considered and made of record all of the documents listed on these Forms, except for GB 1 358 224 which the Examiner crossed off from the May 12, 2006 Form.

At page 2 of the Office Action, the Examiner states that applicants have provided a copy of the Abstract for GB 1 358 224, but have not provided a complete copy of GB 1 358 224 itself.

Applicants enclose a complete copy of GB 1 358 224, together with an Information Disclosure Statement to again cite this document.

The Examiner acknowledges that applicants have elected Group I and Species I in the Response filed on March 25, 2008. The Examiner states that she agrees with applicants' comment that claim 25 should have been part of Group I. The Examiner states that claim 25 was inadvertently omitted from Group I.

With respect to the identification of the claims that read on the elected species of "phosphorescent metal oxides," the Examiner states that claims 17 to 21 are claims that read on the elected species, in addition to claims 1, 5, 6, 8-12 and 14-16.

The Examiner states that JP-B-1033945 is discussed in the present specification. See page 2, line 6 of the present specification. The Examiner states that this document has not been

cited in an Information Disclosure Statement and, therefore, has not been considered. Applicants note that “JP-B-1033945” is an incorrect citation. The correct citation is “JP-C-1033945.” This document corresponds to JP 55-025125 B that was submitted in the Information Disclosure Statement of May 12, 2006, and corresponds to U.S. Patent No. 4,053,577 and GB 1 358 224.

Applicants have amended the specification to correct this citation and are filing an Information Disclosure Statement to cite U.S. Patent 4,053,577 and GB 1 358 224.

The Examiner objects to Fig. 3 because it is very faint, and one cannot see what is shown on the Figure. The Examiner requires that a replacement drawing be filed.

In response, applicants enclose a replacement drawing that more clearly shows the subject matter of Fig. 3.

The Examiner objects to the disclosure because the meaning of the formulas “(Y,Gd)₂O₃,” “(Y,Gd)BO₃,” and “(Mg,Sr,Ba)Al₁₂O₁₉” is unclear. The Examiner states that it is unclear if all of the elements in the parentheses must be present, or if only one need be present. The Examiner states that the prior art interprets these formulas in both ways, and thus applicants need to make clear which interpretation they are using.

The Examiner also rejects claims 18 to 20 as indefinite because of these reasons.

Furthrer, the Examiner states that the formula (Ba,Mg)Al₁₀O₁₇ is incorrect as written. The Examiner states that in the phosphor art, the use of parentheses is interpreted to mean Ba_{1-x}Mg_x, where x is 0-1 or 0<x<1. The Examiner states that the correct way this formula is written is BaMgAl₁₀O₁₇. The Examiner states that appropriate correction is required.

The Examiner also objects to claim 21 for these same reasons.

In response, applicants have amended claims 18-21 to remove the parentheses and to employ the nomenclature of x, 1-x, etc., which is in accordance with the Examiner's understanding of how parentheses are interpreted in the phosphor art. Accordingly, these amendments do not introduce new matter and overcome the rejection and objections.

Claims 1, 5, 8, 9, 12, 14, 16-18 and 21 have been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent 6,391,273 to Konrad et al.

Applicants submit that Konrad et al do not disclose or render obvious the subject matter of the above claims and, accordingly, request withdrawal of this rejection.

The present invention set forth in claim 1 as amended above is directed to a process for producing fine metal oxide particles which process comprises vaporizing a mixed solution of an organometallic compound and an organic solvent to obtain a gaseous mixture and subjecting the gaseous mixture to combustion in a gas phase in the presence of an oxidizing substance.

Thus, claim 1 has been amended to add the phrase "vaporizing a mixed solution of an organometallic compound and an organic solvent to obtain a gaseous mixture and" and to replace the term "organometallic compound" to read "mixture."

Support for the above amendments can be found in the description at page 14, lines 5-7 of the specification that states that "the gaseous organometallic compound is prepared by vaporizing an organometallic compound solution with heating," together with the description at page 14, lines 15-16 that refers to "the solvent used in the organometallic compound solution." See also original claim 15 as well as the working examples of the present specification.

Konrad et al disclose a process for making metal oxides wherein organometallic compounds are evaporated and transferred to the reactor with a carrier gas (argon gas) and reacted with oxygen or oxygen-containing gas to obtain $Y_2O_3:Eu$ nanocrystals having a particle size of less than 100 nm.

However, the process disclosed by Konrad et al is a pyrolysis method, as can be seen from the description at column 4, lines 45-47, which states that “the metalorganic complexes are broken down and the oxidic nanocrystals are formed immediately.”

As compared with the present invention, Konrad et al is silent with respect to the use of an organic solvent as recited in claim 1.

Moreover, the pyrolysis method of Konrad et al is completely different from the combustion method of the present invention as defined in claim 1.

Thus, Konrad et al do not teach or suggest the subject matter of claim 1, or claims that depend from claim 1 directly or indirectly.

As can be seen from the above discussion, the process for producing fine metal oxide particles of the present invention is a combustion method, and is completely different from the pyrolysis method disclosed by Konrad et al.

In the conventional method for producing nanoparticles without the use of an organic solvent, combustibles are only organometallic compounds. Thus, the combustion energy is small.

Therefore, it is difficult to produce nanoparticles having good particle size and distribution because of combustion stability.

Thus, the combustion method has hardly been employed conventionally to produce nanoparticles.

In the present invention, combustion can be stabilized and the feed amounts of organometallic compounds can be controlled precisely by adding an organic solvent to organometallic compounds. Thus, nanoparticles having uniform particle size distribution can be produced as exemplified in the working examples of the specification. See Fig. 3 of the present specification. See, also, page 27, lines 17-19 of the specification.

That is, unexpected results can be obtained by the present invention.

In view of the above, applicants submit that claim 1, and the claims that depend from claim 1, directly or indirectly, are unobvious over Konrad et al and, therefore, request withdrawal of this rejection.

Claims 1, 5, 8-11, 14, 16-18, 20 and 21 have been rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent Application Publication 2002/0179886 to Kumar.

Applicants submit that Kumar does not disclose or render obvious the subject matter or the present claims and, accordingly, request withdrawal of this rejection.

Before discussing the substance of this rejection, applicants note that at pages 5 and 7 of the Office Action, the Examiner refers to various portions of Kumar upon which she relies. Applicants believe the Examiner has not correctly identified the paragraph and page numbers of the portions of Kumar upon which she relies. Applicants set forth below what they believe are the correct identifications.

With respect to the description at page 6, lines 2-4 of the Office Action, applicants believe the Examiner intended to refer to page 9, paragraph [0111] of U.S. Patent Application Publication 2002/0179886 to Kumar, and not column 15.

With respect to the description at page 7, lines 1-3 of the Office Action, applicants believe the Examiner intended to refer to page 9, paragraph [0111] of U.S. Patent Application Publication 2002/0179886 to Kumar, and not column 15.

With respect to the description at page 7, lines 7-8 of the Office Action, applicants believe the Examiner intended to refer to page 4, paragraph [0053] of U.S. Patent Application Publication 2002/0179886 to Kumar, and not column 6, lines 55-56.

Turning now to the substance of the rejection, Kumar discloses a laser pyrolysis method, as described, for example, at page 11, paragraph [0136], that is, Kumar discloses a pyrolysis method with use of a laser. Kumar discloses at page 4, paragraph [0060], that a laser pyrolysis process is different from a process in a combustion reaction and is not a thermal process.

Thus, Kumar does not teach or suggest the subject matter of claim 1 or claims that depend from claim 1, directly or indirectly.

As discussed above, the process for producing fine metal oxide particles of the present invention is a combustion method, and is completely different from the pyrolysis method disclosed by Kumar.

As discussed above, in the conventional method for producing nanoparticles without the use of an organic solvent, combustibles are only organometallic compounds. Thus, the combustion energy is small.

Therefore, it is difficult to produce nanoparticles having good particle size and distribution because of combustion stability.

Thus, the combustion method has hardly been employed conventionally to produce nanoparticles.

In the present invention, combustion can be stabilized and the feed amounts of organometallic compounds can be controlled precisely by adding an organic solvent to organometallic compounds. Thus, nanoparticles having uniform particle size distribution can be produced as exemplified in the working examples of the specification. See Fig. 3 of the specification. See, also, page 27, lines 17-19 of the specification.

That is, unexpected results can be obtained by the present invention.

In view of the above, applicants submit that claim 1, and the claims that depend from claim 1, directly or indirectly, are unobvious over Kumar and, therefore, request withdrawal of this rejection.

Claim 15 has been rejected under 35 U.S.C. § 103(a) as obvious over Konrad et al or Kumar.

Claim 15 depends from claim 1. Accordingly, applicants submit that claim 15 is allowable over Konrad et al and Kumar for the same reasons as discussed above in connection with claim 1.

Claims 6 and 16 have been rejected under 35 U.S.C. § 103(a) as obvious over Kumar.

Claim 6 has been canceled.

Claim 16 depends from claim 1. Accordingly, applicants submit that claim 16 is allowable over Kumar for the same reasons as discussed above in connection with claim 1.

Claim 19 has been rejected under 35 U.S.C. § 103 as obvious over Kumar in view of U.S. Patent Application Publication 2003/0118841 to Horne et al.

Claim 19 depends ultimately from claim 1. Accordingly, applicants submit that claim 19 is patentable over Kumar for the same reasons as claim 1 as discussed above. Horne et al was not cited to supply the deficiencies of claim 1.

With respect to the description at page 7, third and fourth line from the bottom, of the Office Action, applicants believe the Examiner intended to refer to page 15, paragraph [0148] of Horne et al, and not column 28, lines 39-42.

In view of the above, applicants request withdrawal of this rejection.

Claims 20 and 21 have been rejected under 35 U.S.C. § 103(a) as obvious over Konrad et al in view of U.S. Patent 3,574,131 to Ferri et al and U.S. Patent 3,684,730 to Sobon.

Claims 20 and 21 depend ultimately from claim 1. Accordingly, applicants submit that claims 20 and 21 are patentable over Konrad et al for the same reasons as discussed above in connection with claim 1. Ferri et al and Sobon were not cited to supply the deficiencies of claim 1.

In view of the above, applicants request withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

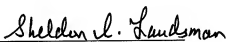
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